SEQUENCE LISTING

<110> CHEN, HONG-HWA
TSAI, WEN-CHIEH
CHEN, WEN-HUEI

<120> DNA MOLECULE ENCODING DEF-LIKE MADS-BOX-GENES FROM PHALAENOPSIS ORCHID

<130> U 014863-8

<140> 10/690,246
<141> 2003-10-21

<150> TW 091125320
<151> 2002-10-25

<160> 48

<170> PatentIn version 3.2

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caggggaaga gagag atg ggg agg ggg aag ata gag ata aaa aag ata gag      111
                 Met Gly Arg Gly Lys Ile Glu Ile Lys Lys Ile Glu
                 1               5                   10

aat ccg acg aac agg caa gtt aca tat tct aag agg aga gtt ggg ata      159
Asn Pro Thr Asn Arg Gln Val Thr Tyr Ser Lys Arg Arg Val Gly Ile
        15                  20                  25

ctg aag aag gcc aag gag ctc act gtt ctc tgt gat gct cag gtc tct      207
Leu Lys Lys Ala Lys Glu Leu Thr Val Leu Cys Asp Ala Gln Val Ser
    30                  35                  40

ctc atc atg ttc tca agc aca gga aag ttg gct gat tac tgc agc ccc      255
Leu Ile Met Phe Ser Ser Thr Gly Lys Leu Ala Asp Tyr Cys Ser Pro
45                  50                  55                  60

tct act gat att aag ggg ata tat gag agg tac cag gtt gtg act gga      303
Ser Thr Asp Ile Lys Gly Ile Tyr Glu Arg Tyr Gln Val Val Thr Gly
                65                  70                  75

atg gat cta tgg aat gct cag tat gag agg atg cag aat acg ctg aag      351
Met Asp Leu Trp Asn Ala Gln Tyr Glu Arg Met Gln Asn Thr Leu Lys
            80                  85                  90

cat ctg aat gag att aac caa aac ctg agg aag gag att agg agg agg      399
His Leu Asn Glu Ile Asn Gln Asn Leu Arg Lys Glu Ile Arg Arg Arg
        95                  100                 105

aag ggg gag gaa ttg gag ggc atg gac ata aag caa ctg cgc ggt ctt      447
Lys Gly Glu Glu Leu Glu Gly Met Asp Ile Lys Gln Leu Arg Gly Leu
    110                 115                 120
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gag caa act ttg gaa gag tct ctt aga att gtt agg cat aga aag tat      495
Glu Gln Thr Leu Glu Glu Ser Leu Arg Ile Val Arg His Arg Lys Tyr
125                 130                 135                 140

cat gtg atc gcc aca caa act gac act tac aag aaa aag ctt aaa agc      543
His Val Ile Ala Thr Gln Thr Asp Thr Tyr Lys Lys Lys Leu Lys Ser
                145                 150                 155

aca agg gaa act tac cgc gct cta ata cat gaa ctg gat atg aaa gag      591
Thr Arg Glu Thr Tyr Arg Ala Leu Ile His Glu Leu Asp Met Lys Glu
            160                 165                 170

gag aat ccg aac tac ggt ttt aat gta gaa aac cag agt aga att tat      639
Glu Asn Pro Asn Tyr Gly Phe Asn Val Glu Asn Gln Ser Arg Ile Tyr
        175                 180                 185

gaa aat tcg att cca atg gtg aat gag tgt cct cag atg ttt tcc ttt      687
Glu Asn Ser Ile Pro Met Val Asn Glu Cys Pro Gln Met Phe Ser Phe
    190                 195                 200

agg gtt gtt cat ccg aat cag ccc aat ctg ctt ggt tta ggt tat gaa      735
Arg Val Val His Pro Asn Gln Pro Asn Leu Leu Gly Leu Gly Tyr Glu
205                 210                 215                 220

tca cat gat ctt agc ctt gca taa tgagcagtaa tattatgatt ttattgtatt      789
Ser His Asp Leu Ser Leu Ala
                225

tttatttttat gtttgaaact ttagaattat gagatggggg atctattcag agagaactgt    849

cctttaattt gattttcccg tttgtttcct cttcatgtcc agtgaaattt tttgttttgt    909

tttttcgg                                                             917
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Arg Gln Val Thr Tyr Ser Lys Arg Arg Val Gly Ile Leu Lys Lys Ala
            20                  25                  30

Lys Glu Leu Thr Val Leu Cys Asp Ala Gln Val Ser Leu Ile Met Phe
        35                  40                  45

Ser Ser Thr Gly Lys Leu Ala Asp Tyr Cys Ser Pro Ser Thr Asp Ile
    50                  55                  60

Lys Gly Ile Tyr Glu Arg Tyr Gln Val Val Thr Gly Met Asp Leu Trp
65                  70                  75                  80

Asn Ala Gln Tyr Glu Arg Met Gln Asn Thr Leu Lys His Leu Asn Glu
                85                  90                  95
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Ile Asn Gln Asn Leu Arg Lys Glu Ile Arg Arg Arg Lys Gly Glu Glu
            100                 105                 110

Leu Glu Gly Met Asp Ile Lys Gln Leu Arg Gly Leu Glu Gln Thr Leu
        115                 120                 125

Glu Glu Ser Leu Arg Ile Val Arg His Arg Lys Tyr His Val Ile Ala
    130                 135                 140

Thr Gln Thr Asp Thr Tyr Lys Lys Lys Leu Lys Ser Thr Arg Glu Thr
145                 150                 155                 160

Tyr Arg Ala Leu Ile His Glu Leu Asp Met Lys Glu Glu Asn Pro Asn
                165                 170                 175

Tyr Gly Phe Asn Val Glu Asn Gln Ser Arg Ile Tyr Glu Asn Ser Ile
            180                 185                 190

Pro Met Val Asn Glu Cys Pro Gln Met Phe Ser Phe Arg Val Val His
        195                 200                 205

Pro Asn Gln Pro Asn Leu Leu Gly Leu Gly Tyr Glu Ser His Asp Leu
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Ser Leu Ala
225
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ccttttcttt cccatatcaa tctcaactcc ttcgcttctc ctgctgcttt gggaagcaga    180

gcaagaaaga gaacc atg ggg agg ggg aag atc gag ata aag aag att gag      231
                 Met Gly Arg Gly Lys Ile Glu Ile Lys Lys Ile Glu
                 1               5                   10

aac cct aca aac agg cag gtt act tac tct aag agg agg gct ggg atc      279
Asn Pro Thr Asn Arg Gln Val Thr Tyr Ser Lys Arg Arg Ala Gly Ile
        15                  20                  25

atg aaa aag gcg agc gag ctc acg gtt ctc tgt gat gct cag ctc tcc      327
Met Lys Lys Ala Ser Glu Leu Thr Val Leu Cys Asp Ala Gln Leu Ser
    30                  35                  40

ctt gtt atg ttc tcc agc acc ggc aag ttc tcc gag tat tgt agt cct      375
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Leu Val Met Phe Ser Ser Thr Gly Lys Phe Ser Glu Tyr Cys Ser Pro
45                  50                  55                  60

acc acc gat acc aag agt gta tat gat cgt tac cag cag gtg tcc ggc      423
Thr Thr Asp Thr Lys Ser Val Tyr Asp Arg Tyr Gln Gln Val Ser Gly
                65                  70                  75

ata aat tta tgg agc gag cag tac gag aag atg cag aat acg ttg aat      471
Ile Asn Leu Trp Ser Glu Gln Tyr Glu Lys Met Gln Asn Thr Leu Asn
            80                  85                  90

cat ttg aag gag ata aac cac aac ttg agg agg gag ata agg cag agg      519
His Leu Lys Glu Ile Asn His Asn Leu Arg Arg Glu Ile Arg Gln Arg
        95                  100                 105

atg ggc gag gat ctt gaa ggg cta gaa atc aaa gaa ctg cgt ggt ctt      567
Met Gly Glu Asp Leu Glu Gly Leu Glu Ile Lys Glu Leu Arg Gly Leu
    110                 115                 120

gag caa aat atg gac gag gcc cta aag ctt gta agg aat cga aag tat      615
Glu Gln Asn Met Asp Glu Ala Leu Lys Leu Val Arg Asn Arg Lys Tyr
125                 130                 135                 140

cac gtc atc agc acc cag aca gat aca ttc aaa aaa aag ttg aaa aac      663
His Val Ile Ser Thr Gln Thr Asp Thr Phe Lys Lys Lys Leu Lys Asn
                145                 150                 155

tct caa gaa acc cac agg aac tta ctc cgg gag ctg gaa act gag cac      711
Ser Gln Glu Thr His Arg Asn Leu Leu Arg Glu Leu Glu Thr Glu His
            160                 165                 170

gcc gtc tac tac gtg gat gat gat cca aac aac tat gat ggc gcg ctt      759
Ala Val Tyr Tyr Val Asp Asp Asp Pro Asn Asn Tyr Asp Gly Ala Leu
        175                 180                 185

gca ctt gga aat ggg gct tcc tac ttg tat tca ttt cgt acc caa cca      807
Ala Leu Gly Asn Gly Ala Ser Tyr Leu Tyr Ser Phe Arg Thr Gln Pro
    190                 195                 200

agc cag ccg aac ctt cag gga gtt gga tat gtc cct cat gat cta cgt      855
Ser Gln Pro Asn Leu Gln Gly Val Gly Tyr Val Pro His Asp Leu Arg
205                 210                 215                 220

ctc gcc tga tcttttatta tctgcatgcc aactgcttaa ttatatctat              904
Leu Ala

gtatctgatg ttcttacgct tacaagtagg gtctagcact gcaatcgaat tcccgcggcc    964

gccagcggcc ggactc                                                   980


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<400>  4

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Arg Gln Val Thr Tyr Ser Lys Arg Arg Ala Gly Ile Met Lys Lys Ala
            20                  25                  30
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Ser Glu Leu Thr Val Leu Cys Asp Ala Gln Leu Ser Leu Val Met Phe
        35                  40                  45

Ser Ser Thr Gly Lys Phe Ser Glu Tyr Cys Ser Pro Thr Thr Asp Thr
    50                  55                  60

Lys Ser Val Tyr Asp Arg Tyr Gln Gln Val Ser Gly Ile Asn Leu Trp
65                  70                  75                  80

Ser Glu Gln Tyr Glu Lys Met Gln Asn Thr Leu Asn His Leu Lys Glu
                85                  90                  95

Ile Asn His Asn Leu Arg Arg Glu Ile Arg Gln Arg Met Gly Glu Asp
            100                 105                 110

Leu Glu Gly Leu Glu Ile Lys Glu Leu Arg Gly Leu Glu Gln Asn Met
        115                 120                 125

Asp Glu Ala Leu Lys Leu Val Arg Asn Arg Lys Tyr His Val Ile Ser
    130                 135                 140

Thr Gln Thr Asp Thr Phe Lys Lys Lys Leu Lys Asn Ser Gln Glu Thr
145                 150                 155                 160

His Arg Asn Leu Leu Arg Glu Leu Glu Thr Glu His Ala Val Tyr Tyr
                165                 170                 175

Val Asp Asp Asp Pro Asn Asn Tyr Asp Gly Ala Leu Ala Leu Gly Asn
            180                 185                 190

Gly Ala Ser Tyr Leu Tyr Ser Phe Arg Thr Gln Pro Ser Gln Pro Asn
        195                 200                 205

Leu Gln Gly Val Gly Tyr Val Pro His Asp Leu Arg Leu Ala
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<213> Phalaenopsis equestris

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tcgcttttgc gtttccagtt ctataaaagg aatccccgcc agagcttttt cttcttatag    120

agctttcttc ctcatctctc ccgttcgtca acatcactaa tcactgctgt ttcagtagac    180

tgggagagct aggagtggag aaaagagatt tgaag atg ggg agg ggg aag ata       233
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                                                Met Gly Arg Gly Lys Ile
                                                1               5

gag att aag aag ata gag aat ccg act aat cgg cag gtg acc tac tcg      281
Glu Ile Lys Lys Ile Glu Asn Pro Thr Asn Arg Gln Val Thr Tyr Ser
            10                  15                  20

aag agg aga gct ggg att atg aag aag gcg agg gag atc act gtt ctc      329
Lys Arg Arg Ala Gly Ile Met Lys Lys Ala Arg Glu Ile Thr Val Leu
        25                  30                  35

tgc gat gct gag gtt tcg ctt atc atg ttc tcg agt act ggg aag ttt      377
Cys Asp Ala Glu Val Ser Leu Ile Met Phe Ser Ser Thr Gly Lys Phe
    40                  45                  50

tct gag tac tgt agc cct tcg acg gaa acg aag aag gtt ttt gaa cgc      425
Ser Glu Tyr Cys Ser Pro Ser Thr Glu Thr Lys Lys Val Phe Glu Arg
55                  60                  65                  70

tac cag cag gta tct ggc att aac ttg tgg agc tcg cag tac gag aag      473
Tyr Gln Gln Val Ser Gly Ile Asn Leu Trp Ser Ser Gln Tyr Glu Lys
                75                  80                  85

atg ctg aat acg ctt aac cat tcg aag gag atc aat cgc aat ctg agg      521
Met Leu Asn Thr Leu Asn His Ser Lys Glu Ile Asn Arg Asn Leu Arg
            90                  95                  100

agg gaa gta agg cag agg atg ggg gaa gat ctt gag gga ctg gat atc      569
Arg Glu Val Arg Gln Arg Met Gly Glu Asp Leu Glu Gly Leu Asp Ile
        105                 110                 115

aag gaa ctg cgc ggt ctt gag caa aac att gat gag gca ttg aag cta      617
Lys Glu Leu Arg Gly Leu Glu Gln Asn Ile Asp Glu Ala Leu Lys Leu
    120                 125                 130

gta cga aat aga aaa tat cat gta atc agt act caa acg gac acc tac      665
Val Arg Asn Arg Lys Tyr His Val Ile Ser Thr Gln Thr Asp Thr Tyr
135                 140                 145                 150

aag aag aag ttg aag aac tcc caa gaa aca cac cgg aac tta atg cac      713
Lys Lys Lys Leu Lys Asn Ser Gln Glu Thr His Arg Asn Leu Met His
                155                 160                 165

gaa ttg gaa atc gtt gag gac cac cca gtg tat ggg ttc cac gag gat      761
Glu Leu Glu Ile Val Glu Asp His Pro Val Tyr Gly Phe His Glu Asp
            170                 175                 180

tca agc aat tat gag ggt gtt ctt gct ctt gca aat gac ggg tct cac      809
Ser Ser Asn Tyr Glu Gly Val Leu Ala Leu Ala Asn Asp Gly Ser His
        185                 190                 195

atg tat gcc ttc cgg gtg caa ccc aac caa caa aat ctt caa gga acg      857
Met Tyr Ala Phe Arg Val Gln Pro Asn Gln Gln Asn Leu Gln Gly Thr
    200                 205                 210

gga tat agc tct cac gat ctt cgc ctc gct tgatataatc gtgtaagtag        907
Gly Tyr Ser Ser His Asp Leu Arg Leu Ala
215                 220

tacaatcaca tatgcagtct tcattttatt gttcgcaaat tatgctctca gtagctggta    967

tctaatgtag aactaactac tgcaacttgc tcttatcttg ctatgtgtga ttctgtggta   1027

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<210> 6
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<213> Phalaenopsis equestris

<400> 6

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            20                  25                  30

Arg Glu Ile Thr Val Leu Cys Asp Ala Glu Val Ser Leu Ile Met Phe
        35                  40                  45

Ser Ser Thr Gly Lys Phe Ser Glu Tyr Cys Ser Pro Ser Thr Glu Thr
    50                  55                  60

Lys Lys Val Phe Glu Arg Tyr Gln Gln Val Ser Gly Ile Asn Leu Trp
65                  70                  75                  80

Ser Ser Gln Tyr Glu Lys Met Leu Asn Thr Leu Asn His Ser Lys Glu
                85                  90                  95

Ile Asn Arg Asn Leu Arg Arg Glu Val Arg Gln Arg Met Gly Glu Asp
            100                 105                 110

Leu Glu Gly Leu Asp Ile Lys Glu Leu Arg Gly Leu Glu Gln Asn Ile
        115                 120                 125

Asp Glu Ala Leu Lys Leu Val Arg Asn Arg Lys Tyr His Val Ile Ser
    130                 135                 140

Thr Gln Thr Asp Thr Tyr Lys Lys Lys Leu Lys Asn Ser Gln Glu Thr
145                 150                 155                 160

His Arg Asn Leu Met His Glu Leu Glu Ile Val Glu Asp His Pro Val
                165                 170                 175

Tyr Gly Phe His Glu Asp Ser Ser Asn Tyr Glu Gly Val Leu Ala Leu
            180                 185                 190

Ala Asn Asp Gly Ser His Met Tyr Ala Phe Arg Val Gln Pro Asn Gln
        195                 200                 205

Gln Asn Leu Gln Gly Thr Gly Tyr Ser Ser His Asp Leu Arg Leu Ala
    210                 215                 220
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<213> Phalaenopsis equestris

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gtaaattccg tccaaggcta aatacgggcg agagaccgat agcgaacaag taccgcgagg 120

ga atg ggg aga ggg aag ata gag ata aag aag ata gag aat cca aca 167
Met Gly Arg Gly Lys Ile Glu Ile Lys Lys Ile Glu Asn Pro Thr
1 5 10 15

agc agg caa gta acg tat tca aag agg cga ctt ggg atc atg aag aag 215
Ser Arg Gln Val Thr Tyr Ser Lys Arg Arg Leu Gly Ile Met Lys Lys
20 25 30

gca gag gaa ctc aca gtg ctc tgc gac gct caa ctc tca ctc atc atc 263
Ala Glu Glu Leu Thr Val Leu Cys Asp Ala Gln Leu Ser Leu Ile Ile
35 40 45

ttc tca agc tcc ggc aag tta gct gat ttc tgc agc cct tcc aca gac 311
Phe Ser Ser Ser Gly Lys Leu Ala Asp Phe Cys Ser Pro Ser Thr Asp
50 55 60

gtt aaa gat ata gtt gag agg tac caa aat gtt acc gga att gat ata 359
Val Lys Asp Ile Val Glu Arg Tyr Gln Asn Val Thr Gly Ile Asp Ile
65 70 75

tgg gat gcg caa tat cag agg atg cag aac act ctg agg aat ctc agg 407
Trp Asp Ala Gln Tyr Gln Arg Met Gln Asn Thr Leu Arg Asn Leu Arg
80 85 90 95

gag att aat cgt aat ctt cag aag gag ata aga cag agg aag ggg gag 455
Glu Ile Asn Arg Asn Leu Gln Lys Glu Ile Arg Gln Arg Lys Gly Glu
100 105 110

aat ctg gaa ggg ttg ggc gtt aaa gag ctg cgc ggt ctt gag caa aaa 503
Asn Leu Glu Gly Leu Gly Val Lys Glu Leu Arg Gly Leu Glu Gln Lys
115 120 125

ttg gag gag tcg gtt aag att gtt cgg cag aga aag tat cat gtg atc 551
Leu Glu Glu Ser Val Lys Ile Val Arg Gln Arg Lys Tyr His Val Ile
130 135 140

gct acg caa aca gac act tgc agg aaa aag ctc aaa agc agc aga caa 599
Ala Thr Gln Thr Asp Thr Cys Arg Lys Lys Leu Lys Ser Ser Arg Gln
145 150 155

ata tac aga gcc cta acg cat gaa ctg cag aag ctg gac gaa gag aat 647
Ile Tyr Arg Ala Leu Thr His Glu Leu Gln Lys Leu Asp Glu Glu Asn
160 165 170 175

caa ccg tgc agt ttt ctc gta gaa gat cta agc tgc atc tat gac agc 695
Gln Pro Cys Ser Phe Leu Val Glu Asp Leu Ser Cys Ile Tyr Asp Ser
180 185 190

tca atc tca atg gca aat cgg ctg cac cgg agt gag cca aat gtg cag 743
Ser Ile Ser Met Ala Asn Arg Leu His Arg Ser Glu Pro Asn Val Gln
195 200 205

aaa gta gtt cgt gag tgt cat gag ttt ggc ttt gat tga cctgcaattt 792
Lys Val Val Arg Glu Cys His Glu Phe Gly Phe Asp

210 215

tctattactt tgtgttacaa tgtggatttg ttttcatggc ttaacatcat aggattgtat 852

aaactatttt tttgtgtgca atgtttaagt tctgatcttg atatcc 898

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<213> Phalaenopsis equestris

<400> 8

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Glu Glu Leu Thr Val Leu Cys Asp Ala Gln Leu Ser Leu Ile Ile Phe
35 40 45

Ser Ser Ser Gly Lys Leu Ala Asp Phe Cys Ser Pro Ser Thr Asp Val
50 55 60

Lys Asp Ile Val Glu Arg Tyr Gln Asn Val Thr Gly Ile Asp Ile Trp
65 70 75 80

Asp Ala Gln Tyr Gln Arg Met Gln Asn Thr Leu Arg Asn Leu Arg Glu
85 90 95

Ile Asn Arg Asn Leu Gln Lys Glu Ile Arg Gln Arg Lys Gly Glu Asn
100 105 110

Leu Glu Gly Leu Gly Val Lys Glu Leu Arg Gly Leu Glu Gln Lys Leu
115 120 125

Glu Glu Ser Val Lys Ile Val Arg Gln Arg Lys Tyr His Val Ile Ala
130 135 140

Thr Gln Thr Asp Thr Cys Arg Lys Lys Leu Lys Ser Ser Arg Gln Ile
145 150 155 160

Tyr Arg Ala Leu Thr His Glu Leu Gln Lys Leu Asp Glu Glu Asn Gln
165 170 175

Pro Cys Ser Phe Leu Val Glu Asp Leu Ser Cys Ile Tyr Asp Ser Ser
180 185 190

Ile Ser Met Ala Asn Arg Leu His Arg Ser Glu Pro Asn Val Gln Lys
195 200 205

Val Val Arg Glu Cys His Glu Phe Gly Phe Asp
210 215

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<213> Artificial

<220>
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<210> 10
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<212> DNA
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<220>
<223> PeMADS3 specific primer

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gcagtgctag accctacttg taagc 25

<210> 11
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<212> DNA
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<220>
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<211> 25
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<220>
<223> PeMADS5 specific primer

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<210> 13
<211> 21
<212> DNA
<213> Artificial

<220>
<223> nested PeMADS2-specific primer

<400> 13
tgattcggat gaacaaccct a 21

<210> 14
<211> 21

<212> DNA
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<220>
<223> nested PeMADS3-specific primer

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aggaagcccc atttccaagt g 21

<210> 15
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<210> 16
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<220>
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<210> 17
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<212> DNA
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<220>
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<400> 17
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<210> 18
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<212> DNA
<213> Artificial

<220>
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<400> 18
tctctctgaa tagatccccc atctc 25

<210> 19
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<220>
<223> PeMADS3-specific internal forward primer

<400> 19
ctctcaagaa acccacag 18

<210> 20
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<212> DNA
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<400> 20
gcagtgctag accctacttg taagc 25

<210> 21
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<212> DNA
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<220>
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<400> 21
gaggaccacc cagtgtat 18

<210> 22
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<220>
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cacagaatca cacatagca 19

<210> 23
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caaacagaca cttgcagg 18

<210> 24
<211> 25
<212> DNA
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<400> 24
tcctatgatg ttaagccatg aaaac 25

<210> 25
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<212> PRT
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<220>
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<221> misc_feature
<222> (2)..(2)
<223> Xaa can be any naturally occurring amino acid

<400> 25

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<220>
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<222> (3)..(3)
<223> Xaa can be any naturally occurring amino acid

<400> 26

Tyr Gly Xaa His Asp Leu Arg Leu Ala
1 5

<210> 27
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<213> Arabidopsis sp.

<400> 27

Met Gly Arg Gly Lys Ile Glu Ile Lys Arg Ile Glu Asn Ala Asn Asn
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20 25 30

Lys Glu Ile Thr Val Leu Cys Asp Ala Lys Val Ala Leu Ile Ile Phe
35 40 45

Ala Ser Asn Gly Lys Met Ile Asp Tyr Cys Cys Pro Ser Met Asp Leu
50 55 60

Gly Ala Met Leu Asp Gln Tyr Gln Lys Leu Ser Gly Lys Lys Leu Trp
65 70 75 80

Asp Ala Lys His Glu Asn Leu Ser Asn Glu Ile Asp Arg Ile Lys Lys

85 90 95

Glu Asn Asp Ser Leu Gln Leu Glu Leu Arg His Leu Lys Gly Glu Asp
100 105 110

Ile Gln Ser Leu Asn Leu Lys Asn Leu Met Ala Val Glu His Ala Ile
115 120 125

Glu His Gly Leu Asp Lys Val Arg Asp His Gln Met Glu Ile Leu Ile
130 135 140

Ser Lys Arg Arg Asn Glu Lys Met Met Ala Glu Glu Gln Arg Gln Leu
145 150 155 160

Thr Phe Gln Leu Gln Gln Gln Glu Met Ala Ile Ala Ser Asn Ala Arg
165 170 175

Gly Met Met Met Arg Asp His Asp Gly Gln Phe Gly Tyr Arg Val Gln
180 185 190

Pro Ile Gln Pro Asn Leu Gln Glu Lys Ile Met Ser Leu Val Ile Asp
195 200 205

<210> 28
<211> 210
<212> PRT
<213> rice

<400> 28

Met Gly Arg Gly Lys Ile Glu Ile Lys Arg Ile Glu Asn Ser Thr Asn
1 5 10 15

Arg Gln Val Thr Phe Ser Lys Arg Arg Ser Gly Ile Leu Lys Lys Ala
20 25 30

Arg Glu Ile Gly Val Leu Cys Asp Arg Glu Val Gly Val Val Ile Phe
35 40 45

Ser Ser Ala Gly Lys Leu Ser Asp Tyr Cys Thr Pro Lys Thr Thr Leu
50 55 60

Ser Arg Ile Leu Glu Lys Tyr Gln Thr Asn Ser Gly Lys Ile Leu Trp
65 70 75 80

Asp Glu Lys His Lys Ser Leu Ser Ala Glu Ile Asp Arg Val Lys Lys
85 90 95

Glu Asn Asp Asn Met Gln Ile Glu Leu Arg His Met Lys Gly Glu Asp
100 105 110

```
Leu Asn Ser Leu Gln Pro Lys Glu Leu Ile Ala Ile Glu Glu Ala Leu
        115                 120                 125

Asn Asn Gly Gln Ala Asn Leu Arg Asp Lys Met Met Asp His Trp Arg
    130                 135                 140

Met His Lys Arg Asn Glu Lys Met Leu Glu Asp Glu His Lys Met Leu
145                 150                 155                 160

Ala Phe Arg Val His Gln Gln Glu Val Glu Leu Ser Gly Gly Ile Arg
                165                 170                 175

Glu Leu Glu Leu Gly Tyr His His Asp Asp Arg Asp Phe Ala Ala Ser
            180                 185                 190

Met Pro Phe Thr Phe Arg Val Gln Pro Ser His Pro Asn Leu Gln Gln
        195                 200                 205

Glu Lys
    210
```

<210> 29
<211> 227
<212> PRT
<213> Antirrhium

<400> 29

```
Met Ala Arg Gly Lys Ile Gln Ile Lys Arg Ile Glu Asn Gln Thr Asn
1               5                   10                  15

Arg Gln Val Thr Tyr Ser Lys Arg Arg Asn Gly Leu Phe Lys Lys Ala
            20                  25                  30

His Glu Leu Ser Val Leu Cys Asp Ala Lys Val Ser Ile Ile Met Ile
        35                  40                  45

Ser Ser Thr Gln Lys Leu His Glu Tyr Ile Ser Pro Thr Thr Ala Thr
    50                  55                  60

Lys Gln Leu Phe Asp Gln Tyr Gln Lys Ala Val Gly Val Asp Leu Trp
65                  70                  75                  80

Ser Ser His Tyr Glu Lys Met Gln Glu His Leu Lys Lys Leu Asn Glu
                85                  90                  95

Val Asn Arg Asn Leu Arg Arg Glu Ile Arg Gln Arg Met Gly Glu Ser
            100                 105                 110

Leu Asn Asp Leu Gly Tyr Glu Gln Ile Val Asn Leu Ile Glu Asp Met
        115                 120                 125
```

```
Asp Asn Ser Leu Lys Leu Ile Arg Glu Arg Lys Tyr Lys Val Ile Ser
    130                 135                 140

Asn Gln Ile Asp Thr Ser Lys Lys Lys Val Arg Asn Val Glu Glu Ile
145                 150                 155                 160

His Arg Asn Leu Val Leu Glu Phe Asp Ala Arg Arg Glu Asp Pro His
                165                 170                 175

Phe Gly Leu Val Asp Asn Glu Gly Asp Tyr Asn Ser Val Leu Gly Phe
            180                 185                 190

Pro Asn Gly Gly Pro Arg Ile Ile Ala Leu Arg Leu Pro Thr Asn His
        195                 200                 205

His Pro Thr Leu His Ser Gly Gly Gly Ser Asp Leu Thr Thr Phe Ala
    210                 215                 220

Leu Leu Glu
225
```

<210> 30
<211> 232
<212> PRT
<213> Arabidopsis sp.

<400> 30

```
Met Ala Arg Gly Lys Ile Gln Ile Lys Arg Ile Glu Asn Gln Thr Asn
1               5                   10                  15

Arg Gln Val Thr Tyr Ser Lys Arg Arg Asn Gly Leu Phe Lys Lys Ala
            20                  25                  30

His Glu Leu Thr Val Leu Cys Asp Ala Arg Val Ser Ile Ile Met Phe
        35                  40                  45

Ser Ser Ser Asn Lys Leu His Glu Tyr Ile Ser Pro Asn Thr Thr Thr
    50                  55                  60

Lys Glu Ile Val Asp Leu Tyr Gln Thr Ile Ser Asp Val Asp Val Trp
65                  70                  75                  80

Ala Thr Gln Tyr Glu Arg Met Gln Glu Thr Lys Arg Lys Leu Leu Glu
                85                  90                  95

Thr Asn Arg Asn Leu Arg Thr Gln Ile Lys Gln Arg Leu Gly Glu Cys
            100                 105                 110

Leu Asp Glu Leu Asp Ile Gln Glu Leu Arg Arg Leu Glu Asp Glu Met
        115                 120                 125
```

```
Glu Asn Thr Phe Lys Leu Val Arg Glu Arg Lys Phe Lys Ser Leu Gly
    130                 135                 140

Asn Gln Ile Glu Thr Thr Met Lys Lys Asn Lys Ser Gln Gln Gly Ile
145                 150                 155                 160

Gln Lys Asn Leu Ile His Glu Leu Glu Leu Arg Ala Glu Asp Pro His
                165                 170                 175

Tyr Gly Leu Val Asp Asn Gly Gly Asp Tyr Asp Ser Val Leu Gly Tyr
            180                 185                 190

Gln Ile Glu Gly Ser Arg Ala Tyr Ala Leu Arg Phe His Gln Asn His
        195                 200                 205

His His Tyr Tyr Pro Asn His Gly Leu His Ala Pro Ser Ala Ser Asp
    210                 215                 220

Ile Ile Thr Phe His Leu Leu Glu
225                 230
```

<210> 31
<211> 223
<212> PRT
<213> rice

<400> 31

```
Met Gly Arg Gly Lys Ile Glu Ile Lys Arg Ile Lys Asn Ala Thr Asn
1               5                   10                  15

Arg Gln Val Thr Tyr Ser Lys Arg Arg Thr Gly Ile Met Lys Lys Ala
            20                  25                  30

Arg Glu Leu Thr Val Leu Cys Asp Ala Gln Val Ala Ile Ile Met Phe
        35                  40                  45

Ser Ser Thr Gly Lys Tyr His Glu Phe Cys Ser Pro Ser Thr Asp Ile
    50                  55                  60

Lys Gly Ile Phe Asp Arg Tyr Gln Gln Ala Ile Gly Thr Ser Leu Trp
65                  70                  75                  80

Ile Glu Gln Tyr Glu Asn Met Gln Arg Thr Leu Ser His Leu Lys Asp
                85                  90                  95

Ile Asn Arg Asn Leu Arg Thr Glu Ile Arg Gln Arg Met Gly Glu Asp
            100                 105                 110

Leu Asp Gly Leu Glu Phe Asp Glu Leu Arg Gly Leu Glu Gln Asn Val
        115                 120                 125
```

```
Asp Ala Ala Leu Lys Glu Val Arg His Arg Lys Tyr His Val Ile Ser
    130                 135                 140

Thr Gln Thr Glu Thr Tyr Lys Lys Lys Val Lys His Ser Tyr Glu Ala
145                 150                 155                 160

Tyr Lys Thr Leu Gln Gln Glu Leu Gly Leu Cys Glu Glu Pro Ala Trp
                165                 170                 175

Phe Val Asp Asn Thr Gly Gly Gly Trp Asp Gly Gly Ala Gly Ala Gly
            180                 185                 190

Ala Ala Ala Asp Met Phe Ala Phe Arg Val Val Pro Ser Gln Pro Asn
        195                 200                 205

Leu His Gly Met Ala Tyr Gly Gly Asn His Asp Leu Arg Leu Gly
    210                 215                 220
```

<210> 32
<211> 227
<212> PRT
<213> maize

<400> 32

```
Met Gly Arg Gly Lys Ile Glu Ile Lys Arg Ile Glu Asn Ala Thr Asn
1               5                   10                  15

Arg Gln Val Thr Tyr Ser Lys Arg Arg Thr Gly Ile Met Lys Lys Ala
            20                  25                  30

Arg Glu Leu Thr Val Leu Cys Asp Ala Gln Val Ala Ile Ile Met Phe
        35                  40                  45

Ser Ser Thr Gly Lys Tyr His Glu Phe Cys Ser Pro Gly Thr Asp Ile
    50                  55                  60

Lys Thr Ile Phe Asp Arg Tyr Gln Gln Ala Ile Gly Thr Ser Leu Trp
65                  70                  75                  80

Ile Glu Gln Tyr Glu Asn Met Gln Arg Thr Leu Ser His Leu Lys Asp
                85                  90                  95

Ile Asn Arg Gly Leu Arg Thr Glu Ile Arg Gln Arg Met Gly Glu Asp
            100                 105                 110

Leu Asp Ser Leu Asp Phe Asp Glu Leu Arg Gly Leu Glu Gln Asn Val
        115                 120                 125

Asp Ala Ala Leu Lys Glu Val Arg His Arg Lys Tyr His Val Ile Ser
    130                 135                 140
```

```
Thr Gln Thr Asp Thr Tyr Lys Lys Lys Val Lys His Ser His Glu Ala
145                 150                 155                 160

Tyr Lys Asn Leu Gln Gln Glu Leu Gly Met Arg Glu Asp Pro Ala Phe
                165                 170                 175

Gly Tyr Val Asp Asn Thr Gly Ala Gly Val Ala Trp Asp Gly Ala Ala
            180                 185                 190

Ala Ala Leu Gly Gly Ala Pro Pro Asp Met Tyr Ala Phe Arg Val Val
        195                 200                 205

Pro Ser Gln Pro Asn Leu His Gly Met Ala Tyr Gly Phe His Asp Leu
    210                 215                 220

Arg Leu Gly
225
```

<210> 33
<211> 228
<212> PRT
<213> Lilium longiflorum

<400> 33

```
Met Gly Arg Gly Lys Ile Glu Ile Lys Lys Ile Glu Asn Ser Thr Asn
1               5                   10                  15

Arg Gln Val Thr Tyr Ser Lys Arg Arg Thr Gly Ile Ile Lys Lys Ala
            20                  25                  30

Thr Glu Leu Thr Val Leu Cys Asp Ala Glu Val Ser Leu Leu Met Phe
        35                  40                  45

Ser Ser Thr Gly Lys Leu Ser Glu Phe Cys Ser Pro Ser Thr Asp Thr
    50                  55                  60

Lys Lys Ile Phe Asp Arg Tyr Gln Gln Leu Ser Gly Ile Asn Leu Trp
65                  70                  75                  80

Ser Ala Gln Tyr Glu Lys Met Gln Asn Thr Leu Asn His Leu Ser Glu
                85                  90                  95

Ile Asn Arg Asn Leu Arg Lys Glu Ile Ser Gln Arg Met Gly Glu Glu
            100                 105                 110

Leu Asp Gly Leu Asp Ile Lys Asp Leu Arg Gly Leu Glu Gln Asn Leu
        115                 120                 125

Asp Glu Ala Leu Lys Leu Val Arg His Arg Lys Tyr His Val Ile Asn
    130                 135                 140
```

```
Thr Gln Thr Glu Thr Tyr Lys Lys Lys Val Lys Asn Ser Glu Glu Ala
145                 150                 155                 160

His Lys Asn Leu Leu Arg Asp Leu Val Asn Arg Glu Met Lys Asp Glu
                165                 170                 175

Asn Pro Val Tyr Gly Tyr Val Asp Glu Asp Pro Ser Asn Tyr Asp Gly
            180                 185                 190

Gly Leu Gly Leu Ala Asn Gly Ala Ser His Leu Tyr Glu Phe Arg Val
        195                 200                 205

Gln Pro Ser Gln Pro Asn Leu His Gly Met Gly Tyr Gly Ser His Asp
    210                 215                 220

Leu Arg Leu Ala
225
```

<210> 34
<211> 30
<212> PRT
<213> Lysopersicon esculentum

<400> 34

```
Val His Asn Leu Tyr Ala Phe Arg Leu Gln Pro Leu His Pro Asn Leu
1               5                   10                  15

Gln Asn Glu Gly Gly Phe Gly Ser Arg Asp Leu Arg Leu Ser
            20                  25                  30
```

<210> 35
<211> 32
<212> PRT
<213> rice

<400> 35

```
Gly Ala Ala Ala Asp Met Phe Ala Phe Arg Val Val Pro Ser Gln Pro
1               5                   10                  15

Asn Leu His Gly Met Ala Tyr Gly Gly Asn His Asp Leu Arg Leu Gly
            20                  25                  30
```

<210> 36
<211> 32
<212> PRT
<213> Triticum aestivum

<400> 36

```
Gly Leu Ala Ala Asp Met Tyr Ala Phe Arg Val Val Pro Ser Gln Pro
1               5                   10                  15

Asn Leu His Gly Met Ala Tyr Gly Gly Ser His Asp Leu Arg Leu Gly
```

20 25 30

<210> 37
<211> 31
<212> PRT
<213> maize

<400> 37

Gly Ala Pro Pro Asp Met Tyr Ala Phe Arg Val Val Pro Ser Gln Pro
1 5 10 15

Asn Leu His Gly Met Ala Tyr Gly Phe His Asp Leu Arg Leu Gly
20 25 30

<210> 38
<211> 31
<212> PRT
<213> Sagittaria montevidensis

<400> 38

Arg Pro Ala Asp Val Gly Tyr Ala Phe His His Ser Ala Gly Gln Ser
1 5 10 15

Asn Val His Asp Val Gly Tyr Gly Phe His Glu Leu Arg Leu Ala
20 25 30

<210> 39
<211> 28
<212> PRT
<213> Phalaenopsis equestris

<400> 39

Ser Tyr Leu Tyr Ser Phe Arg Thr Gln Pro Ser Gln Pro Asn Leu Gln
1 5 10 15

Gly Val Gly Tyr Val Pro His Asp Leu Arg Leu Ala
20 25

<210> 40
<211> 29
<212> PRT
<213> Phalaenopsis equestris

<400> 40

Pro Gln Met Phe Ser Phe Arg Val Val His Pro Asn Gln Pro Asn Leu
1 5 10 15

Leu Gly Leu Gly Tyr Glu Ser His Asp Leu Ser Leu Ala
20 25

<210> 41
<211> 29
<212> PRT

<213> Phalaenopsis equestris

<400> 41

Ser His His Tyr Ala Phe Arg Val Gln Pro Asn Gln Gln Asn Leu Gln
1 5 10 15

Gly Thr Gly Tyr Ser Ser His Met Asp Leu Arg Leu Ala
20 25

<210> 42
<211> 31
<212> PRT
<213> Lilium longiflorum

<400> 42

Asn Gly Ala Ser His Leu Tyr Glu Phe Arg Val Gln Pro Ser Gln Pro
1 5 10 15

Asn Leu His Gly Met Gly Tyr Gly Ser His Asp Leu Arg Leu Ala
20 25 30

<210> 43
<211> 29
<212> PRT
<213> Papaver nudicaule

<400> 43

Pro Asn Ile Phe Ala Phe Arg Leu Gln Pro Ser Gln Pro Asn Leu His
1 5 10 15

Asn Gly Gly Gly Tyr Asn Cys His Asp Leu Arg Leu Ala
20 25

<210> 44
<211> 17
<212> PRT
<213> Magnolia figo

<400> 44

Ala His Ile Leu His Asp Thr Gly Phe Gly Ile His Asp Leu Arg Leu
1 5 10 15

Ala

<210> 45
<211> 29
<212> PRT
<213> Dicentra eximia

<400> 45

Gln Asn Ile Phe Ala Phe Arg Leu Gln Pro Ser Gln Pro Asn Leu His
1 5 10 15

Asp Gly Gly Gly Tyr Gly Ser His Asp Leu Arg Leu Ala
20 25

<210> 46
<211> 31
<212> PRT
<213> Phalaenopsis equestris

<400> 46

Tyr Asp Ser Ser Ile Ser Met Ala Asn Arg Leu His Arg Ser Glu Pro
1 5 10 15

Asn Val Gln Lys Val Val Arg Glu Cys His Glu Phe Gly Phe Asp
20 25 30

<210> 47
<211> 14
<212> PRT
<213> Dianthus caryophyllus

<400> 47

Ala Ala Ala Asn Leu Phe Ala Leu Ser Arg His Pro Ile Thr
1 5 10

<210> 48
<211> 20
<212> PRT
<213> Artificial

<220>
<223> Artificial PI motif-derived and PaleoAP3 motif

<400> 48

Phe Phe Arg Leu Gln Pro Ser Gln Pro Asn Leu His Tyr Gly His Asp
1 5 10 15

Leu Arg Leu Ala
20